

Mint of the United States at Philadelphia,

MELTING AND REFINING DEPARTMENT.

Philadelphia, 17th April —, 1880.Sir,

I regret to Report that the Spelter we have on hand, being part of a large lot purchased last Fall, is quite unfit for use in refining silver and gold, because it prevents our obtaining silver of a full grade of fineness, or of a sufficiently soft quality for rolling well and stamping, and is liable to cause loss of both silver and gold by volatilization.

Before making the first purchase of this Spelter last Fall, the Assayer reported that the sample was free from lead, and since it was offered at a lower rate than some other spelter, it was purchased. After using it for a time, one piece of peculiar appearance was specially tested, and upon its showing lead to the assay, we examined a chip cut off from each of six different numbers of slabs, (there were 10 in all), and finding no lead in them, we supposed

posed the finding of lead was accidental, and continued using the Spelter with confidence. After a few months' use I found that my silver refused to be made finer than 995@ 997 without much fluxing and manifest loss, showing that, either the silver bars we received contained lead or base metal, or that the spelter contained it. A careful and extended examination by the assayer and myself proved that the foulness of our silver was due to impurities in the Spelter, most frequently lead, and in one case arsenic, beside the lead, — that the impurity was not uniformly distributed, being more abundant in one slab than another, and sometimes wholly absent — and that a small quantity of lead protects some of the zinc against solution in dilute sulphuric acid, so that when the reduced silver is melted the enclosed zinc volatilizes, carrying off silver with it. This is an entirely new experience in reducing silver, and explains some loss of the precious metal hitherto unexplained. The evil may extend further, for we are sometimes obliged to use our reduced

Mint of the United States at Philadelphia,

MELTING AND REFINING DEPARTMENT,

3

Philadelphia, _____, 188 ____

reduced silver in refining gold, and suffer the risk of losing some gold by volatilization when melting granulations of gold & silver. When zinc is actually present in this case, the loss is certain, and in direct proportion to the amount of zinc.

After trying these experiments for months while refining with acid (which is only occasionally), I had some slabs of different Nos melted, & the assayer found lead in every part of the granulated zinc. I next tried several slabs, of one number, and one of the slabs was free from lead, but the granulated metal showed lead all through. Since lead is unequally distributed through it, the smelter is plainly unfit for our use.

We have just finished the 1st and 2nd purchases of last Fall, and there remains the lot of over 6000 lbs. purchased in January last. In view of

the

The lack of fineness in our refined silver, — the lack of softness for rolling and stamping, — and the certainty of some loss to the Government in silver and gold, — by the use of this spelter, — I respectfully suggest that it would be to the interest of the Government to sell the balance we have on hand, and make a purchase of some other spelter. I may remark in this connection that I have heard practical men speak very favorably of the spelter of Pope, Cole & Co. of Baltimore, preferring it to all others. This was the sample that the Assayer pronounced last Fall superior to the other two. There is also a new article of spelter just entering the market, a sample of which, tested by the Assayer within a few weeks proved to be remarkably pure.

Very respectfully yours
J. C. Booth

Hon A. Loudon Snowden
Superintendent.

MVR

399 1/2

Mint of the United States at Philadelphia,

MELTING AND REFINING DEPARTMENT,

17 Ape, 1880.

Jas. C. Booth

Melter, and Refiner.

Report, on fitness of
 the last Spelter for re-
 fining Silver & gold,
 on account of the
 presence of lead &
 sometimes arsenic.

Recommended sale
 of about one, 6,000 lbs,
 a purchase of new.

Pipe, cast & C &
 Ballo. furnished good
 article - & another party

No. of Enclosures, _____

Rec'd April 18th 1880.

[Abstract:] Reports unfitness of the last Spelter for refining silver & gold... 399 1/2

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Melting and Refining Department,
Philadelphia,
April 17, 1880

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